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February 17, 2016

VIA CERTIFIED MAIL AND ELECTRONIC MAIL

Jeffrey L. Hunter
JHunter@perkinscoie.com
D. +1.503.727.2265
F. +1.503.346.2265

Katie McClintock
Air Enforcement Officer
EPA Region 10
1200 Sixth Avenue, Suite 900, OCE-101
Seattle, WA 98101

Re: Request for Information to Bullseye Glass Company

Dear Ms. McClintock:

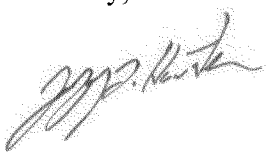
On behalf of Bullseye Glass Company ("Bullseye"), this letter and accompanying information and documents are sent in response to the U.S. Environmental Protection Agency's ("EPA") February 10, 2016 information request as modified by your February 12, 2016 email (the "Information Request"). As agreed, Bullseye is providing information in response to the first three requests. Bullseye anticipates providing responses to the remaining requests and supplementing, if required, the information and documents provided herewith within the next two weeks.

Please note this information on Attachments 1 and 2 is confidential business information pursuant to 40 CFR § Part 2, Subpart B. The batch information and furnace melt capacities are proprietary information. Consistent with 40 CFR § 2.208, Bullseye Glass takes reasonable measures to protect the confidentiality of the information and it intends to continue to take such measures. The information is not, and has not been, reasonably obtainable without Bullseye's consent. To Bullseye's knowledge no statute specifically requires disclosure of the information. Disclosure of the information is likely to cause substantial harm to Bullseye's competitive position. It is Bullseye's position that this information does not constitute emissions data under 40 CFR § 2.301. We request that EPA maintain this information as confidential. Your cooperation in this regard is greatly appreciated.

In submitting this response, Bullseye is not consenting to EPA's authority to make the Information Request to Bullseye and reserves its right to object to EPA's assertion of such authority. In addition, Bullseye does not waive any right, privilege, or objection which Bullseye may have in any subsequent proceeding related in any way to this response. Bullseye reserves the right to object to the use of any information provided in this response for any evidentiary purpose whatsoever. By providing this response, Bullseye is not waiving any privilege which may be claimed as to this response, any documents provided herein or which may be provided in the future, or as to any discussions related to the issues outlined in this response. Bullseye reserves the right to supplement this response.

After you have reviewed this information, please contact me to discuss the additional information requests to confirm that Bullseye is providing the relevant and appropriate information.

Sincerely,



Jeffrey L. Hunter
Counsel for Bullseye Glass Company

Enclosure: CD with furnace temperature information

cc: Eric Durran, Bullseye Glass Company

Bullseye Glass Company's Responses
to EPA's Information Request

Bullseye Glass Company hereby responds to your information requests. For your convenience, we have repeated the request followed by Bullseye's response.

Information Request No. 1: Size of each furnace/schematic labeled with furnace info.

Response: *See* Attachment 1. Attachment 1 contains a furnace roster and a typical schematic of a furnace at Bullseye.

Information Request No. 2: Batch tickets for each furnace and each melt going back to 10/1/15.

Response: *See* Attachment 2. Attachment 2 contains the batch tickets for October 5, 2016 through October 6, 2015 and October 12, 2015 through October 19, 2015. These batch tickets are representative of typical operations. Once you have reviewed this information, we will supplement as appropriate with additional batch tickets.

Information Request No. 3: Temperature readings at backwall for each furnace going back to 10/1/15 at whatever frequency recorded. These readings would preferably be in spreadsheet format and include the date and furnace number.

Response: Spreadsheets containing temperature readings going back to October 1, 2015 for each furnace are enclosed on the disc accompanying the hardcopy version of this letter.

Information Request No. 4: Confirm the dates each furnace was converted to oxyfuel or any other major modifications other than a brick-for-brick rebuild back to 1996.

Response: This information will be provided within two weeks.

Information Request No. 5: Refractory materials purchased for last 3 years.

Response: This information will be provided within two weeks.

Since you have familiarity, can you help describe the process and glass manufacturing operations? Here are a few things that would be useful to know:

Jaclyn and George: I am happy to help provide my understanding of the process. The description of the facilities and processes included in this email are based on my observations when I did site visits and what I have learned talking to the companies since. I am attempting to portray the facts as I know them, about the operations, and am not interpreting those facts.

- A description of the furnaces

Bullseye and Uroboros both primarily use a furnace type called a "day tank." These day tanks resemble larger production furnaces used in the container and float glass industries, but are much smaller. They are built on-site and are composed of several different types of refractory (brick) material. The general design is a cube with a rounded (crown) top. It is filled with glass at the bottom and gas an air or oxygen fired just above the maximum glass line. The exhaust is then vented out of a flu. When the glass is finished melting, it must be removed with a ladle. Since often these furnaces are changing color, they remove as much glass as possible before starting the next batch. If they are making the same color, they may leave a little in the bottom between melts.

Bullseye also has a few pot furnaces which are made of a solid ceramic material that sits in a refractory lined construct which heats the pot from the sides. This is a small amount of the overall production. The remainder of this discussion focuses on the day-tanks/furnaces.

The day tanks at Bullseye are primarily fired using oxygen and natural gas. There are two burners in each day tank on opposing corners. The day tanks at Uroboros use air and natural gas and some have a heat exchange (recuperator) to pre-heat the combustion air. Most have one burner. The combustion happens above the raw materials/glass and heat transfer happens through the surface of the glass, where there is also volatilization of raw materials. Off gassing from this volatilization and offgassing from chemical reactions within the glass are exhausted out the stack with the combustion gases.

Temperatures in the furnace are generally around 2500 degrees F during melting. I understand the furnaces can be dialed back slightly while glass is ladled out if the glass doesn't harden too much. After the furnace is empty, they are turned back to high in order to pre-het the furnace back up to 2500 before charging new raw materials.

- Production schedule

For the day tanks at Bullseye and Uroboros, they melt on an approximately 24 hour schedule with 5-8 hours to add raw materials (they break up the raw materials into smaller batches and "charge" the furnace several times over this period), 6-8 hours to cook, and 6-8 hours to ladle glass out of the furnace.

My understanding is that these furnaces are kept hot for at around 350-500 melts of glass (24 hours per melt). Then they are taken down and all of the brick is replaced before it is reheated. Once the furnace begins operation after a re-bricking, the furnace is always kept above 2000 F and are constantly firing natural gas and air (or oxygen). These furnaces are never cooled to ambient temperatures if they are not being re-bricked. For the most part the furnaces melt batches of glass sequentially, with only a brief reheat period from the lower temperatures at the end of a batch (2200 F or so) back up near 2500 F.

However, the furnaces can be idled down to 2000 F as well if they are not needed to melt glass.

Each business may have a slightly different operating schedule. My understanding is that Bullseye melts glass from Sunday mid-day to Friday evening. Uroboros operates about 4 consecutive days per week (M-Th, or T-F). Furnaces can idle at other times (meaning sitting empty but at least 2000 F), because of holidays, economy, or desire to coordinate furnace schedules so their products can be mixed.

- A description of the overall process

At both facilities they mix their own recipes of glass, which contains basic ingredients like sand and smaller ingredients like metal oxides (for color and glass quality). They then mix these ingredients together and then add them to the furnace over a period of 5-8 hours. Once the glass is done cooking, workers hand ladle the glass out and roll it into flat sheets. These flat sheets are then coated (if necessary), and put through an annealing lehr to control the cooling so the glass doesn't fracture. The glass sheets are then trimmed and packed for shipping to customers (or sale in house). The trimmings can be re-melted in future batches or can be crushed to sell as a product called "frit."

- Anything else you think we should know about the glass manufacturing process

Capacity info? This was claimed cbi so I can't include it.
Other info I can't think of right now.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

John O'Donnell
CEO
Kokomo Opalescent Glass
1310 South Market Street
Kokomo, IN 46902

Re: Supplemental Request to Provide Information Pursuant to Section 114 of the Clean Air Act

Dear Mr. O'Donnell,

The enclosed supplemental information request is being issued to you pursuant to Section 114 of the Clean Air Act (CAA), 42 U.S.C. § 7414. The Environmental Protection Agency is seeking additional information concerning Kokomo Opalescent Glass' facility in Kokomo, IN.

Under Section 114 of the CAA, EPA is authorized to require the submission of records, reports, and other information for the purpose of determining whether any violations of the CAA have occurred. In accordance with this authority, you are hereby served the enclosed Information Request, and required to provide the requested responses and documents within seven (7) days of receipt of this Request for questions 1-8. Provide the remaining responses within (30) days of receipt of this Request. See Enclosures 1 and 2 for the instructions, definitions, and Information Requests.

You must submit a copy of the full response to:

Sara Froikin
Stationary Source Enforcement Branch
Air Enforcement Division
U.S. Environmental Protection Agency
SARA's ADDRESS

Katie McClintock
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Regional contact

Failure to provide the required information in a timely manner may lead to civil action to obtain compliance or to recover a civil penalty in accordance with Section 113 of the CAA, 42 U.S.C. § 7413. EPA also has authority to seek criminal penalties from any person who knowingly makes any false statement, representation, or certification. Even if you fully comply with this letter, you may still be subject to administrative, civil, or criminal action as provided by the CAA.

You are entitled to assert a claim of business confidentiality, covering all or any required information, in the manner described at 40 C.F.R. § 2.203(b). See Enclosure 3 for instructions on assertion of business confidentiality claims. Note that emissions data, which includes information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of emission data, is not entitled to confidential treatment. Information subject to a claim of business confidentiality will be made available to the public only in accordance with the procedures set forth at 40 C.F.R. Part 2, Subpart B. Unless a confidentiality claim is asserted at the time the required information is provided, EPA may make this information available to the public without further notice to you.

This required submission of information is not subject to the approval requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. §§ 3501, et seq.

Any technical questions regarding this Information Request should be directed to Katie McClintock, Office of Civil Enforcement, at (206) 553-2143, mcclintock.katie@epa.gov; for legal matters, contact Sara Froikin, Office of Civil Enforcement, at (212) 637-3263, froikin.sara@epa.gov

Sincerely,

Phillip A. Brooks, Director
Air Enforcement Division

Enclosures (3)

cc: regional contact
Katie McClintock, EPA
Sara Froikin, EPA

ENCLOSURE 1

A. INSTRUCTIONS:

1) Please provide a separate narrative response to each Information Request and subpart of an Information Request set forth in Enclosure 2 of this Information Request and precede each answer with the number of the Information Request to which it corresponds.

2) For each Information Request, identify each person responding to any Information Request contained in this Information Request on your behalf, as well as each person consulted in the preparation of a response.

3) For each Information Request, identify each document consulted, examined, or referred to in the preparation of the response or that contains information responsive to the Information Request, and provide a true and correct copy of each such document if not provided in response to another specific Information Request. Indicate on each document produced in response to this Information Request the number of the Information Request to which it corresponds.

4) If requested information or documents are not known or are not available to you at the time of your response to this Information Request, but later become known or available to you, you must supplement your response to EPA. Moreover, should you find at any time after submission of your response that any portion is or becomes false, incomplete, or misrepresents the facts; you must provide EPA with a corrected response as soon as possible.

5) Requested information can be submitted in electronic form if applicable.

For purposes of this Information Request, the definitions set forth in Section B shall apply and should be considered carefully by you in preparing your responses.

B. DEFINITIONS:

1) "Document" means written documentation of any kind, including documentation solely in electronic form. It includes any document in the possession or control of Kokomo Opalescent Glass or the possession or control of any person or entity acting as an agent of Kokomo Opalescent Glass. A copy of a document rather than the original may be provided.

2) “Facility” means the Kokomo Opalescent Glass facility in Kokomo, Indiana.

3) The terms “person” or “persons” shall have the meaning set forth in Section 302(e) of the Act, 42 U.S.C. § 7602(e), and include an individual, corporation, partnership, association, State, municipality, political subdivision of a State, and any agency, department, or instrumentality of the United States and any officer, agent or employee thereof.

4) The terms "you" or "your", as used above and in each Information Request set forth in Enclosure 2 of this Information Request, refer to, and shall mean, Kokomo Opalescent Glass, including its subsidiaries, divisions, affiliates, predecessors, successors, assigns, and its former and present officers, directors, agents, employees, representatives, attorneys, consultants, accountants and all other persons acting on its behalf.

ENCLOSURE 2

INFORMATION REQUEST

You are hereby required, in accordance with Section 114(a) of the Act, 42 U.S.C. § 7414(a), to provide the following information regarding the Facility.

1. Provide a facility plot plan or diagram of the Facility and a narrative description of all manufacturing processes conducted at the Facility. Both should include, but are not be limited to, all points where any emissions or dust are generated, pollution control devices, raw material receiving/handling, batch mixing, each glass melting furnace, glass coating or etching processes, any glass reheating processes, annealing lehrs, frit and cullet processing, and other units that support glass production.

2. Provide a list of each glass melting furnace currently operating at the Facility.

3. For each furnace identified in response to Question 3, provide the following information:

    a. The type of the furnace (e.g., regenerative, recuperative, oxyfuel, electric);
    b. A schematic of the furnace including the tank size, burner position and exhaust points;
    c. A description of the furnace operation including how often the furnace is cooled down to ambient temperatures;
    d. For furnaces that pull glass out continuously, provide:
        i. The maximum pull of the furnace (tons/hr);
        ii. The holding capacity of the furnace (lbs);
        iii. The maximum pull of the furnace (tons/yr);
    e. For furnaces that melt glass in a batch process, provide:
        i. The maximum holding capacity of the furnace (lbs);
        ii. The maximum and minimum times between the start of two consecutive melts.
        iii. The calculated maximum annual production (tpy) and explanation of the calculation;

4. Annual production (tpy) from each furnace for the last 5 years.

5. Provide a copy of the current air permit for the facility (if applicable) and the engineering support document.

6. A list of all raw materials used at the facility in the last 3 years and the material safety data sheet (MSDS) for each.

7. Provide purchase invoices for all compounds containing chromium, cadmium, arsenic, nickel and lead for the past 3 years.

8. A complete list of all batch recipes that the company has made in the last 3 years.

9. Daily batch records for the last year. For each batch indicate the date and furnace number as well as the complete ingredient list and quantity.

10. Glass coating/etching?

11. For each furnace identified in response to question 3, provide:

    a. An explanation of how raw materials are charged into the furnace;
    b. The fuel fired in the furnace and the maximum combined firing rate (mmbtu/hr) for the burners in the furnace.
    c. The amount of electricity used to melt glass, if used..
    d. The date the furnace began operation;
    e. Any dates after 1986 that the Furnace was converted from air to oxyfuel, enlarged in size, or modified to increase air emissions. Provide the date of the project, a description of the project, and the effect on emissions and production.
    f. The dates of the last rebricking on the furnace.
    g. A list of all instances in the last 5 years when the furnace has been cooled to ambient temperature for a reason other than maintenance, malfunction, control device installation, reconstruction or rebuilding. If so explain the date, the reason, and the length of time the furnace was at ambient temperature.

12. For each furnace identified in response to question 3, identify and describe any combustion or post-combustion emission control equipment or practices that are used for any reason. For each, provide the following information and provide data to support the answers:

    a. The reason the equipment was installed, the date of the installation and the pollutant(s) the equipment is designed to reduce.
    b. Describe in detail how each emission control equipment or reduction practice limits air emissions from each source, and how effectively (in terms of removal efficiency, capture efficiency, distribution efficiency, etc.) each air emission is limited by the corresponding equipment or practice.
    c. Any engineering documents for the control device related to the emissions reduction performance of the controls device.
    d. Any engineering documents for any capture system associated with the control device.
    e. If there is any monitoring of the device (temperature, pressure, etc) that is a parameter for performance, provide the source test establishing the parameter and the last year

of records of that parameter.

13. Is the facility subject to Part 61, Subpart N? If so, provide the following records for the last two years:
    a. Annual emissions of arsenic from each furnace.
    b. All records required under 40 C.F.R. § 61.165.

14. Is the facility subject to Part 63, Subpart SSSSSS? If no furnaces are subject, explain for each why it is not subject. For any units that are subject provide a copy of the notifications required under 40 C.F.R. § 63.11456 and the last two years of records required under 40 C.F.R § 63.11457.

15. For raw material handling, provide a schematic of the batch mixing setup including the original batch mixing, mixing of the colorants, transfer of the batch to the blender, blending of the batch, transfer of the batch out of the blender, and charging the raw materials into the furnace. For each point, provide an explanation of any air pollution capture system, flow rates if known, and any design of the rooms/air system to limit dust creation. For each collection system, provide the total flow rates for each intake and the design flow rate of the system.

16. Does the Facility crush glass to sell as frit or for other disposal? If yes, provide a detailed schematic of the crushing operation. For each point of emissions in the process, provide an explanation of any air pollution capture efforts at that point including an explanation and drawing of the capture system. If the frit process is enclosed in any larger room, explain how this is done, openings to the larger factory and whether the room exhaust is vented to a control device. For the collection system, provide the total flow rates for each intake and the design flow rate of the system.

17. Does the facility spray any coatings on the glass? If so, describe the process in detail (including a detailed description of the process step where the coatings are applied), the chemicals sprayed along with their MSDSs, the quantity of each chemical used each year for the last 3 years, a description of emissions from the process (including a description of any visible emissions during coating) and a description of any emissions capture/control system.

18. For each baghouse, explain what is done with the baghouse dust. If the dust is melted onsite, explain where it is stored before melting, which furnace it is melted in, the frequency of the melting and what is done with the glass after melting.

19. Provide copies of each stack emissions test conducted on each furnace or baghouse stack since 1990. This request includes tests done to determine compliance with permits or regulatory standards, engineering tests, and tests for general information. Provide the batch records for all glasses made in furnaces, routed into the furnace, or batches mixed/blended that were routed into the baghouse.

20. Provide information on the refractory the Facility uses in their furnaces, both for the tanks of the furnaces and the superstructure. If the Facility uses different refractory in different

furnaces, provide information on the refractory products used in each furnace. For each refractory, provide the MSDS from the manufacturer and an invoice. If the facility uses the same refractory in each tank and superstructure, provide invoices since January 1, 2014.

21. For each furnace that measures temperature inside of the furnace, provide:
    a. The point where the temperature is measured;
    b. Temperature readings for the last year (on the frequency recorded) in spreadsheet format.

ENCLOSURE 3

CONFIDENTIAL BUSINESS INFORMATION ASSERTION AND SUBSTANTIATION REQUIREMENTS

A. Assertion Requirements

You may assert a business confidentiality claim covering all or part of the information requested in response to this information request, as provided in 40 C.F.R. Section 2.203(b). You may assert a business confidentiality claim covering such information by placing on (or attaching to) the information you desire to assert a confidentiality claim, at the time it is submitted to the EPA, a cover sheet, stamped, or typed legend (or other suitable form of notice) employing language such as "trade secret" or "proprietary" or "company confidential." Allegedly confidential portions of otherwise non-confidential documents should be clearly identified, and may be submitted separately to facilitate identification and handling by the EPA. If you desire confidential treatment only until a certain date or until the occurrence of a certain event, the notice should so state. Information covered by such a claim will be disclosed by the EPA only to the extent, and by means of the procedures, set forth in Section 114(c) of the Clean Air Act (the Act) and 40 C.F.R. Part 2. The EPA will construe the failure to furnish a confidentiality claim with your response to the attached letter as a waiver of that claim, and the information may be made available to the public without further notice to you.

B. Substantiation Requirements

All confidentiality claims are subject to the EPA verification in accordance with 40 C.F.R. Part 2, subpart B. The criteria for determining whether material claimed as confidential is entitled to such treatment are set forth at 40 C.F.R. Sections 2.208 and 2.301, which provide, in part, that you must satisfactorily show that you have taken reasonable measures to protect the confidentiality of the information and that you intend to continue to do so; that the information is not and has not been reasonably obtainable by legitimate means without your consent; and the disclosure of the information is likely to cause substantial harm to your business's competitive edge.

Pursuant to 40 C.F.R. Part 2, subpart B, the EPA may at any time send you a letter asking you to substantiate fully your CBI claim. If you receive such a letter, you must provide the EPA with a response within the number of days set forth in the EPA request letter. Failure to submit your

comments within that time would be regarded as a waiver of your confidentiality claim or claims, and the EPA may release the information. If you receive such a letter, the EPA will ask you to specify which portions of the information you consider confidential. You must be specific by page, paragraph, and sentence when identifying the information subject to your claim. Any information not specifically identified as subject to a confidentiality claim may be disclosed without further notice to you. For each item or class of information that you identify as being subject to CBI, you must answer the following questions, giving as much detail as possible, in accordance with 40 C.F.R. 2.204(e):

1. What specific portions of the information are alleged to be entitled to confidential treatment? For what period of time do you request that the information be maintained as confidential, until a certain date, until the occurrence of a specified event, or permanently? If the occurrence of a specific event will eliminate the need for confidentiality, please specify that event.

2. Information submitted to the EPA becomes stale over time. Why should the information you claim as confidential be protected for the time period specified in your answer to question #1?

3. What measures have you taken to protect the information claimed as confidential? Have you disclosed the information to anyone other than a governmental body or someone who is bound by an agreement not to disclose the information further? If so, why should the information still be considered confidential?

4. Is the information contained in any publicly available material such as the Internet, publicly available databases, promotional publications, annual reports, or articles? Is there any means by which a member of the public could obtain access to the information? Is the information of a kind that you would customarily not release to the public?

5. Has any governmental body made a determination as to the confidentiality of the information? If so, please attach a copy of the determination.

6. For each category of information claimed as confidential, explain with specificity why release of the information is likely to cause substantial harm to your competitive position. Explain the specific nature of those harmful effects, why they should be viewed as substantial, and the causal relationship between disclosure and such harmful effects. How could your competitors make use of this information to your detriment?

7. Do you assert that the information is submitted on a voluntary or a mandatory basis? Please explain the reason for your assertion. If you assert that the information is voluntarily submitted information, explain whether and why disclosure of the information would tend to lessen the availability to the EPA of similar information in the future.

8. Any other issue you deem relevant.

Please note that emission data provided under Section 114 of the Act, 42 U.S.C. Section 7414, is not entitled to confidential treatment under 40 C.F.R. Part 2, subpart B.

Emission data means, with reference to any source of emission of any substance into the air:

(A) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of any emission which has been emitted by the source (or of any pollutant resulting from any emission by the source), or any combination of the foregoing;

(B) Information necessary to determine the identity, amount, frequency, concentration, or other characteristics (to the extent related to air quality) of the emissions which, under an applicable standard or limitation, the source was authorized to emit (including, to the extent necessary for such purposes, a description of the manner and rate of operation of the source); and

(C) A general description of the location and/or nature of the source to the extent necessary to identify the source and to distinguish it from other sources (including, to the extent necessary for such purposes, a description of the device, installation, or operation constituting the source).

40 C.F.R. Sections 2.301(a)(2)(i)(A), (B) and (C).

If you receive a request for a substantiation letter from the EPA, you bear the burden of substantiating your confidentiality claim. Conclusory allegations will be given little or no weight in the determination. If you fail to claim the information as confidential, it may be made available to the public without further notice to you.

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: Matthews, Julie
Sent: Thur 2/18/2016 3:30:38 PM
Subject: Re: Metal monitoring in moss in SE Portland

Yeah. After I sent it I looked at it again and realized that it probably was just a power point. I wonder if Rob has access to the whole report?

Sent from my iPhone

On Feb 17, 2016, at 7:49 PM, McClintock, Katie <McClintock.Katie@epa.gov> wrote:

> Thank you. This is the power point I was mentioning. I still haven't seen the actual study come through.
>
> **From:** Matthews, Julie
> **Sent:** Wednesday, February 17, 2016 8:25 AM
> **To:** McClintock, Katie <McClintock.Katie@epa.gov>
> **Subject:** FW: Metal monitoring in moss in SE Portland
>
> Katie- see the link below to the moss study.
>
> Juliane Matthews
>
> Assistant Regional Counsel
>
> U.S. Environmental Protection Agency- Region 10
>
> 1200 Sixth Avenue, Suite 900, ORC -113
>
> Seattle, WA 98101
>
> (206) 553-1169
>
> matthews.juliane@epa.gov

From: Matthews, Julie
Sent: Thursday, February 04, 2016 11:47 AM
To: Leefers, Kristin <leefers.kristin@epa.gov>
Subject: FW: Metal monitoring in moss in SE Portland

This is the moss study report

Juliane Matthews

Assistant Regional Counsel

U.S. Environmental Protection Agency- Region 10

1200 Sixth Avenue, Suite 900, ORC -113

Seattle, WA 98101

(206) 553-1169

matthews.juliane@epa.gov

From: Elleman, Robert
Sent: Wednesday, February 03, 2016 4:07 PM
To: Downey, Scott <Downey.Scott@epa.gov>; Matthews, Julie <Matthews.Juliane@epa.gov>; Hastings, Janis <Hastings.Janis@epa.gov>; Suzuki, Debra <Suzuki.Debra@epa.gov>; Dossett, Donald <Dossett.Donald@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: Islam, Mahbubul <Islam.Mahbubul@epa.gov>
Subject: Metal monitoring in moss in SE Portland

http://www.lar.wsu.edu/nw-airquest/docs/20150624_meeting/20150625_Donovan_moss.pdf

Robert Elleman

Meteorologist

EPA Region 10, Seattle

(206) 553-1531

elleman.robert@epa.gov

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: Matthews, Julie
Sent: Wed 2/17/2016 4:25:13 PM
Subject: FW: Metal monitoring in moss in SE Portland

Katie- see the link below to the moss study.

Juliane Matthews

Assistant Regional Counsel

U.S. Environmental Protection Agency- Region 10

1200 Sixth Avenue, Suite 900, ORC -113

Seattle, WA 98101

(206) 553-1169

matthews.juliane@epa.gov

From: Matthews, Julie
Sent: Thursday, February 04, 2016 11:47 AM
To: Leefers, Kristin <leefers.kristin@epa.gov>
Subject: FW: Metal monitoring in moss in SE Portland

This is the moss study report

Juliane Matthews

Assistant Regional Counsel

U.S. Environmental Protection Agency- Region 10

1200 Sixth Avenue, Suite 900, ORC -113

Seattle, WA 98101

(206) 553-1169

matthews.juliane@epa.gov

From: Elleman, Robert
Sent: Wednesday, February 03, 2016 4:07 PM
To: Downey, Scott <Downey.Scott@epa.gov>; Matthews, Julie <Matthews.Juliane@epa.gov>; Hastings, Janis <Hastings.Janis@epa.gov>; Suzuki, Debra <Suzuki.Debra@epa.gov>; Dossett, Donald <Dossett.Donald@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: Islam, Mahbubul <Islam.Mahbubul@epa.gov>
Subject: Metal monitoring in moss in SE Portland

http://www.lar.wsu.edu/nw-airquest/docs/20150624_meeting/20150625_Donovan_moss.pdf

Robert Elleman

Meteorologist

EPA Region 10, Seattle

(206) 553-1531

elleman.robert@epa.gov

To: McClintock, Katie[McClintock.Katie@epa.gov]; Shelow, David[Shelow.David@epa.gov]
From: Landis, Matthew
Sent: Mon 3/7/2016 1:44:53 AM
Subject: RE: Portland glass facilities

Hi Katie,

Not a problem for me. I will be in the field this week Monday – Wednesday and generally out of pocket.

Matt

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Matthew S. Landis, Ph.D.
Senior Research Environmental Health Scientist
US EPA Office of Research and Development
109 T.W. Alexander Drive
Mail Drop E205-03
Research Triangle Park, NC 27711
Phone: (919) 541-4841
Fax: (919) 541-0960
E-mail: landis.matthew@epa.gov
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- *Passion without reason is blind, reason without passion is DEAD (Spinoza- Ethics)*

From: McClintock, Katie
Sent: Saturday, March 05, 2016 1:19 AM
To: Shelow, David <Shelow.David@epa.gov>; Landis, Matthew <Landis.Matthew@epa.gov>
Subject: FW: Portland glass facilities

Hi Matt and Dave –

I'm the point person for this project in Region 10 (and somewhat EPA) on the technical side. Your email was forwarded to me. Looks like you had a great technical call with Geoffrey yesterday. I am posting your notes for this call on our onedrive for this project. Please let me know if that isn't okay and I will remove it. I am granting you both access to the onedrive in case you need it. Let me know if you would also like to receive my daily update emails (which are posted on the onedrive each night).

Thanks.

Katie

From: Koerber, Mike
Sent: Friday, March 04, 2016 10:12 AM
To: Hastings, Janis <Hastings.Janis@epa.gov>; Bray, Dave <Bray.Dave@epa.gov>
Cc: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: FW: Portland glass facilities

As a followup to today's call, here is the summary of the call with USFS.

Mike

From: Shelow, David
Sent: Friday, March 04, 2016 12:29 PM
To: Wayland, Richard <Wayland.Richard@epa.gov>; Fox, Tyler <Fox.Tyler@epa.gov>; Benedict, Kristen <Benedict.Kristen@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Watkins, Tim <Watkins.Tim@epa.gov>; Johnson, Steffan <johnson.steffan@epa.gov>; Hemby, James <Hemby.James@epa.gov>; Landis, Matthew <Landis.Matthew@epa.gov>
Subject: RE: Portland glass facilities

Here are the notes from our call with the researcher Geoff Donovan.

Dave and Matt.

David M. Shelow
National Air Toxics Ambient Monitoring Program Manager
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Ambient Air Monitoring Group C304-06
Research Triangle Park, NC 27711
Phone: 919-541-3776
Fax:: 919-541-1903
Email: shelow.david@epa.gov

From: Wayland, Richard
Sent: Wednesday, March 02, 2016 3:14 PM
To: Fox, Tyler <Fox.Tyler@epa.gov>; Benedict, Kristen <Benedict.Kristen@epa.gov>; Weinstock, Lewis <Weinstock.Lewis@epa.gov>
Cc: Watkins, Tim <Watkins.Tim@epa.gov>; Shelow, David <Shelow.David@epa.gov>; Johnson, Steffan <johnson.steffan@epa.gov>; Hemby, James <Hemby.James@epa.gov>
Subject: FW: Portland glass facilities

Hi folks,

In the attached memo, Janet outlines several actions being undertaken by EPA in response to the Portland Bullseye Glass air toxics issue. Specifically, there are 3 things that we (AQAD) are responsible for tracking.

1. Improving our characterization of emissions from art glass manufacturing facilities

2. Asses the viability of the original USFS study (Moss monitoring) as a screening methodology for air toxics

3. Review screening modeling by Puget Sound

Mike Koerber has asked for a short paragraph on each of these 3 activities by early next week. On the Moss monitoring, I have not heard from the USFS scientist and an cc:ing Tim Watkins to see if the fellow has contacted him yet. On the other two, can you guys help me pull a paragraph together to get back to Mike? Maybe try for a draft by Friday and we can finalize it next week.

Thanks

Chet

Richard A. "Chet" Wayland | Director | Air Quality Assessment Division - Mail Code C304-02 | Office of Air Quality Planning & Standards | U.S. Environmental Protection Agency | Research Triangle Park, NC 27711 | Desk: 919-541-4603 | Cell: 919-606-0548 | Fax: 919-541-4511 |

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: Steve Van Slyke
Sent: Fri 3/4/2016 7:18:17 PM
Subject: Fwd: Toxic Emissions from Art Glass Facilities

Sent from my Verizon Wireless 4G LTE smartphone

-------- Original message --------
From: Erik Saganić <ErikS@pscleanair.org>
Date: 03/04/2016 10:13 AM (GMT-08:00)
To: Carole Cenci <CaroleC@pscleanair.org>, Steve Van Slyke <SteveV@pscleanair.org>
Cc: Kathy Strange <KathyS@pscleanair.org>, Brian Renninger <BrianR@pscleanair.org>, Joanne Todd <JoanneT@pscleanair.org>
Subject: FW: Toxic Emissions from Art Glass Facilities

I got bcc'd on this, so you all likely got it too, but FYI in case:

From: BANDROWSKI, MIKE [mailto:Bandrowski.Mike@epa.gov]
Sent: Friday, March 04, 2016 10:00 AM
Subject: Toxic Emissions from Art Glass Facilities

An issue associated with toxic emissions from art glass facilities has been identified (see background below) and we want to make you aware of this issue.

High levels of air toxics were monitored in the air near two art glass manufacturing facilities in Portland, Oregon. The EPA has been working closely with Oregon officials to further understand the emissions and the risk to the public, if any and to work to reduce any risk to the public. As a precaution, the EPA is gathering information to better understand similar art glass manufacturing plants across the country – e.g., locations, air emissions, pollution controls, business operations, etc. Our current information indicates that there are fewer than 20 art glass manufacturing plants nationwide with significant emissions levels. Further

understanding of these facilities will inform what actions we take to ensure compliance with existing regulations as well as to review and, if necessary, revise the current federal emission standards to ensure these plants operate in an environmentally safe manner.

While EPA is looking into this issue, we also want to alert our state, local, and tribal partners. If you know of facilities that meet the following criteria, please let us know.

- The art, architectural, or colored glass manufacturing facilities of concern are those who melt raw materials (metals) to make their glass, this gives them more control over the colors produced. The facilities would have large distribution of their products.

- Those who are hobby and crafts glass blowers typically buy colored glass to melt down for their projects and due to its small size, are not part of the inquiries at this time.

- EPA is looking for facilities with uncontrolled furnace emissions.

- Arsenic and cadmium are of concern, but so is hexavalent chrome…in fact, chrome+3 ***may*** convert to chrome+6 in the presence of manganese and high heat.

Background

The U.S. Forest Service (USFS), in a pilot study, found moss collected f
manufacturers in the Portland area—and Bullseye Glass in particular—h
of heavy metals than other areas in the city. This result prompted the Or
Environmental Quality (ODEQ) to set up air monitoring systems near th
samples every few days over a 30-day period in October 2015.

In early February, ODEQ made publicly available the results of that air
levels of cadmium and arsenic in the air and began investigating potenti
suggests that the metals found in the monitoring were coming in large p
glass manufacturing facility. Elevated cadmium levels were also found
glass manufacturer, Uroboros Glass. Both companies have suspended th

cadmium; Bullseye, which also used arsenic, has suspended its use. OD
http://www.deq.state.or.us/nwr/docs/metalsem/FSDEQAdressingAirTox
regular updates and technical information on the Portland Metals websit
http://www.deq.state.or.us/nwr/metalsemissions.htm.

OAQPS has identified 14 other similar facilities, which, like Bullseye ar
art glass and may use raw metals in their processes. A Clean Air Act Na
Hazardous Air Pollutants (NESHAP) (40 CFR Part 63, Subpart SSSSSS
sources has been in effect since 2007. This rule applies to continuous fu

more of glass per year using any amount of toxic metals in the glass recip

Mike Bandrowski | Manager, Office of Air Toxics, Radiation and Indoor Air

U.S. Environmental Protection Agency | Region 9| Air Division, Air-6 | 75 Hawthorne St |

San Francisco, CA 94105 |Tel 415.947-4194 | bandrowski.mike@epa.gov

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: Elleman, Robert
Sent: Fri 3/4/2016 1:58:04 AM
Subject: RE: a question about your CBI data

Thanks. I read the sampling report in more detail. ODEQ is going to be measuring PM10, just like they have been. And they will have met data from the Reed College site and also from a site just to the SW of Bullseye. I'm concerned about the representativeness of that new site too, although having it to compare to Reed College is helpful. I'd advocate for a site in the Fred Meyer parking lot since it is quite free of obstacles to mess with the wind.

As for the Italy article, my main question would be whether their emissions are combustion related (PM2.5) or mechanical (PM10). It makes a big difference for fallout. Their monitors were more downwind from the emissions source than we have here in Bullseye. They measured both air concentration and deposition rate. I didn't see that ODEQ was going to measure deposition rate. I know ODEQ is testing soils….

From: McClintock, Katie
Sent: Thursday, March 03, 2016 5:44 PM
To: Elleman, Robert <Elleman.Robert@epa.gov>
Subject: Re: a question about your CBI data

I can't remember. I'll check tonight. They got a limited amount of data.

Sent from my iPhone

On Mar 3, 2016, at 5:37 PM, Elleman, Robert <Elleman.Robert@epa.gov> wrote:

> Katie,
>
> Would DEQ already have that CBI data? Should I direct Phil Allen at DEQ to talk to someone in particular at his agency to get the data? He will need it to interpret his modeling results, or at a minimum for me and him to interpret the met analysis?

Thanks,

Rob

Robert Elleman

Meteorologist

EPA Region 10, Seattle

(206) 553-1531

elleman.robert@epa.gov

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: INAHARA Jill
Sent: Thur 3/3/2016 11:20:32 PM
Subject: RE: baghouse on glass furnace?

Thanks much, Katie!

From: McClintock, Katie [mailto:McClintock.Katie@epa.gov]
Sent: Thursday, March 03, 2016 3:20 PM
To: INAHARA Jill
Subject: RE: baghouse on glass furnace?

I'm sorry I didn't response to this. I just was reading through company records and my memory was jogged that this came in while I was on a call earlier.

I have some stack test data from Spectrum that was submitted to Puget Sound (and therefore public) but it is not speciated for metals. I will send that along in a separate email with the description from the permit writer on the test method. This unfortunately doesn't tell you how well it is working for metals specifically, but my observations on site were that the baghouse is likely collecting at least some of the metals.

They claimed everything CBI so for the moment, I can't share much more. However, even with data, the tricky part is that stained glass making is variable (reds some days, greens another, etc) so data on stack tests or dust fines is only going to be representative of a short period of time. We need a bigger picture approach, which I am also working on.

Let me know if you have further questions and we can talk more on the phone as well if that is easier.

Katie McClintock

Air Enforcement Officer

EPA Region 10

1200 Sixth Avenue, Suite 900, OCE-101

Seattle, WA 98101

Phone: 206-553-2143

Fax: 206-553-4743

Mcclintock.katie@epa.gov

From: INAHARA Jill [mailto:INAHARA.Jill@deq.state.or.us]
Sent: Thursday, March 03, 2016 8:50 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: RE: baghouse on glass furnace?

I assume it works well? Any test data? I think I already know the answer to that one.

Thanks, Katie!

From: McClintock, Katie [mailto:McClintock.Katie@epa.gov]
Sent: Thursday, March 03, 2016 8:48 AM
To: INAHARA Jill
Subject: RE: baghouse on glass furnace?

Spectrum Glass in Woodinville, Washington. Let me know if you have more questions.

From: INAHARA Jill [mailto:INAHARA.Jill@deq.state.or.us]
Sent: Thursday, March 03, 2016 8:46 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: baghouse on glass furnace?

Hi Katie,

Can you please tell me the name of the company that has a baghouse installed on a stained-glass furnace? And where it is located? I'm putting together some talking points.

Thanks!

Jill

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: INAHARA Jill
Sent: Thur 3/3/2016 4:49:38 PM
Subject: RE: baghouse on glass furnace?

I assume it works well? Any test data? I think I already know the answer to that one.

Thanks, Katie!

From: McClintock, Katie [mailto:McClintock.Katie@epa.gov]
Sent: Thursday, March 03, 2016 8:48 AM
To: INAHARA Jill
Subject: RE: baghouse on glass furnace?

Spectrum Glass in Woodinville, Washington. Let me know if you have more questions.

From: INAHARA Jill [mailto:INAHARA.Jill@deq.state.or.us]
Sent: Thursday, March 03, 2016 8:46 AM
To: McClintock, Katie <McClintock.Katie@epa.gov>
Subject: baghouse on glass furnace?

Hi Katie,

Can you please tell me the name of the company that has a baghouse installed on a stained-glass furnace? And where it is located? I'm putting together some talking points.

Thanks!

Jill

To: McClintock, Katie[McClintock.Katie@epa.gov]
From: PALERMO Jaclyn
Sent: Thur 3/3/2016 4:21:28 PM
Subject: glass facility list
Colored_Glass_Sources_needing_research.xlsx

Katie,

I attached the list of glass facilities. Please note that this list is very preliminary and it appears that the sources either generate colored glass or work with the glass (glass blowing). This list will very likely be smaller once their facility operations are understood. Chris has a basic description of how the list was compiled below. Let me know if you have any questions.

Jaclyn

From: SWAB Christopher
Sent: Thursday, February 18, 2016 4:54 PM
To: STOCUM Jeffrey
Cc: PALERMO Jaclyn
Subject: RE: Cadmium list

Jeffrey,

•□□□□□□□ Rob Elleman at EPA sent me a list of sources that he received from someone in EPA's GIS dept.

•□□□□□□□ I called OSHA, but cannot remember who(m) I talked to. However, the person at OSHA recommended that I call Nathan Johnson at the Oregon Dept. of Consumer and Business Services. Nathan queried their employer system and found 50 primary place of business (PPB) locations in Oregon beginning with a NAICS in 32721X, and an additional 148 non-primary locations in OR. Nathan's contact info is:

Nathan Johnson, MPH

Research Analyst

Oregon Dept. of Consumer and Business Services,

Research & Analysis

503.947.7194 | nathan.johnson@state.or.us

•□□□□□□□ I combined the EPA list, Nathan's list, and our initial pull from Business Analyst Online. I eliminated duplicates by address. Then I eliminated all sources that did not have an NAICS code of either 327211 (flat glass manufacturing) or 327212 (other pressed and blown glass and glassware manufacturing). I sent this list to Justin.

•□□□□□□□ Don Petit and In subsequently queried the Fire Marshal's database for establishments that use or store cadmium compounds. The results contained some establishments that were not on the list I sent to Justin. I haven't had time yet to determine the business types of those additional establishments.

Chris

From: STOCUM Jeffrey
Sent: Thursday, February 18, 2016 3:29 PM
To: SWAB Christopher; PALERMO Jaclyn
Subject: Cadmium list

Chris would you lay out your path to the cadmium companies list again?

i.e. you called X and they told you to call Y who finally got you the info…Thank you.

Jeffrey

Jeffrey Stocum / Air Quality Technical Services Manager / Environmental Solutions Division

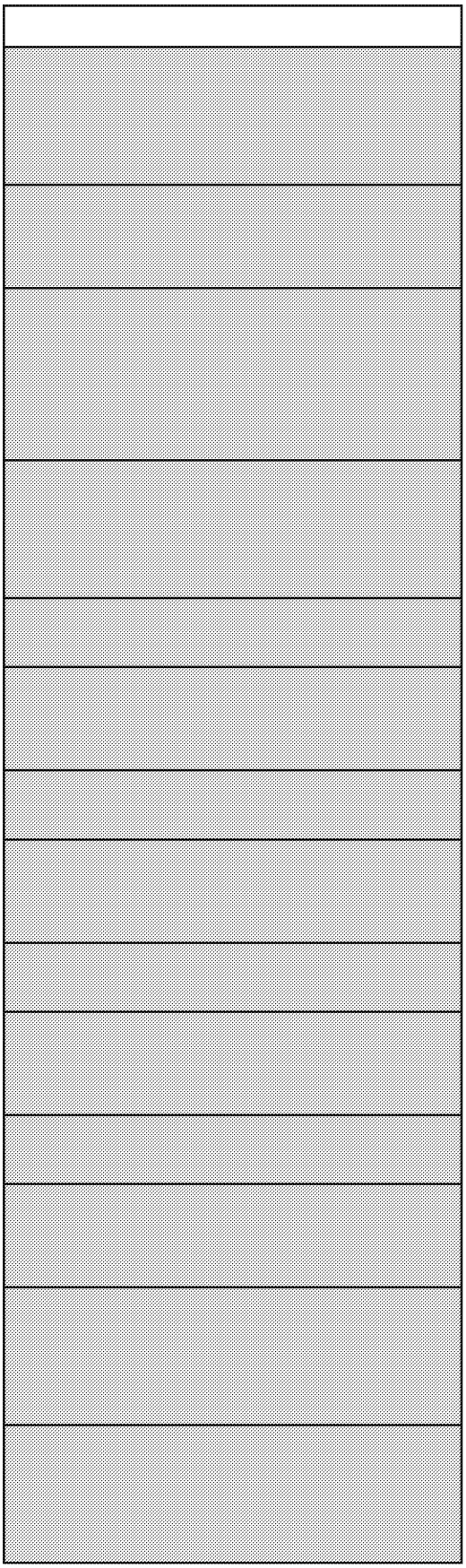
Phone: 503-229-5506 / email: stocum.jeffrey@deq.state.or.us

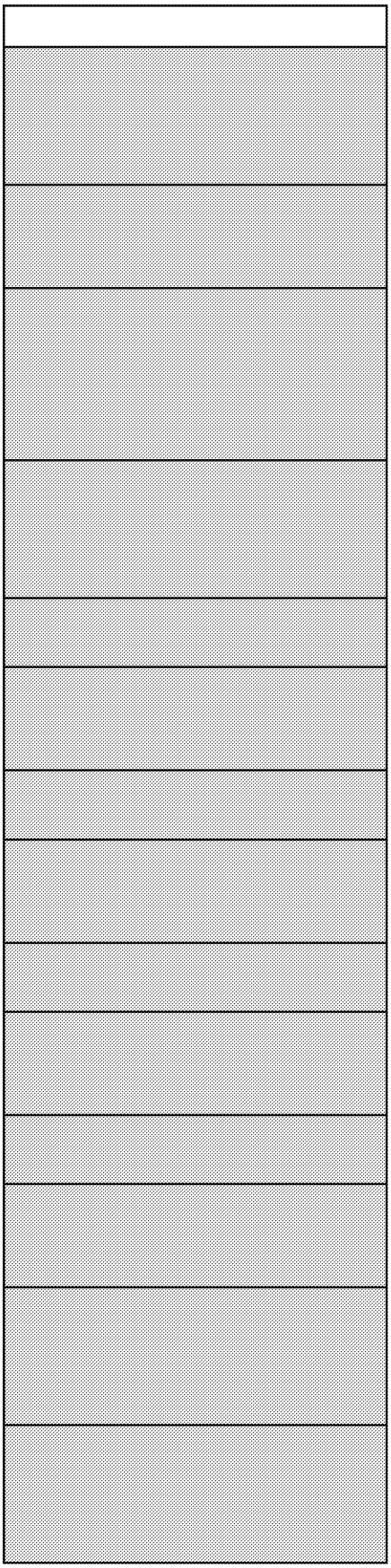
Colored Glass needing further research:		
Michael Molk Glassblower	*1315 Se Park Ave*	*Corvallis*
Glasscraft, Inc.	*3844 Janisse St*	*Eugene*
Fibercore Ltd	*11185 Se 282nd Ave*	*Boring*
Potters Industries, Inc.	*350 Nw Baker Dr*	*Canby*
Owens-Brockway Glass Container Inc.	*9710 Ne Glass Plant Rd*	*Portland*
Oregon Glass Company	*10450 Sw Ridder Rd*	*Wilsonville*
BULLSEYE GLASS CO.	*3722 Se 21st Ave*	*Portland*
Savoy Glass LLC	*13908 N Lombard St*	*Portland*
Glass Alchemy Ltd	*6539 Ne 59th Pl*	*Portland*
Gmr Glass Resources Inc	*5598 Table Rock Rd #106*	*Central Point*
Sky Glass Inc	*3805 Janisse St*	*Eugene*
Ocean Beaches Glass	*11175 Nw Pacific Coast Hwy*	*Seal Rock*
Icefire Glassworks	*116 E Gower St*	*Cannon Beach*
Acme Art Glass Inc	*2346 Sterling Creek Rd*	*Jacksonville*

Benton	*OR*	*97333*	*44.538903*	*-123.25415*	*Pressed and blown glass, nec, nsk*
Lane	*OR*	*97402*	*44.045402*	*-123.153614*	*Products of purchased glass*
Clackamas	*OR*	*97009*	*45.441599*	*-122.373009*	*Pressed and blown glass, nec, nsk*
Clackamas	*OR*	*97013*	*45.260553*	*-122.705778*	*Products of purchased glass*
Multnomah	*OR*	*97220*	*45.565163*	*-122.567409*	*Glass containers*
Clackamas	*OR*	*97070*	*45.332404*	*-122.784306*	*Products of purchased glass*
Multnomah	*OR*	*97202*	*45.496053*	*-122.64447*	*Flat glass, nsk*
Multnomah	*OR*	*97203*	*45.623707*	*-122.771438*	*Products of purchased glass*
Multnomah	*OR*	*97218*	*45.569058*	*-122.601644*	*Flat glass, nsk*
Jackson	*OR*	*97502*	*42.39749*	*-122.885143*	*Products of purchased glass*
Lane	*OR*	*97402*	*44.045676*	*-123.153449*	*Flat glass, nsk*
Lincoln	*OR*	*97376*	*44.503874*	*-124.08077*	*Products of purchased glass*
Clatsop	*OR*	*97110*	*45.890127*	*-123.961535*	*Pressed and blown glass, nec, nsk*
Jackson	*OR*	*97530*	*42.268664*	*-122.982384*	*Pressed and blown glass, nec, nsk*

Still operating; Michael Molk, Owner; (541) 754-0336
Still operating; Facility in CO; Sales of colored glass and supplies
Still operating; Trailers; 1-2 buildings (~1300-1800 SF), parking for ~7 Vehicles; 7004 U.S. Route 42 Mt. Gilead, OH 43338 (HQ); info@fibrecore.com *Tel: 419-362-4591*
Still operating; (503) 266-7814; World's largest producer of highway safety marking glass beads, metal finishing beads for cleaning and strengthening metals, glass media for grinding and dispersing, glass microspheres for friction and weight reduction in oil drilling applications and metal-coated particles to provide electromagnetic shielding interference of electronic parts.
Still Operating; (503) 254-7331; www.o-i.com
Still operating; www.hartung-glass.com; Supplier of flat glass (•Heavy Cases•Light Cases•Mini Cases•Clear•Tint•Acrylic & Polycarbonate•Low E•Laminated•Mirror•Wire•Reflective); Heat Treating
Still operating-but ceased use of Cadmium 2/2016 ; (503) 232-8887
Still operating; 503.282.5095; Art glass; etched, stained, dichroic, beveled, blown and kiln-cast,fused and laminated gla
Still operating; 503-460-0545; Rod, Frit, Tube, Crucibles
Still operating; (541) 821-3983; Auto glass replacement service; Commercial glass & aluminum doors
Still operating; (888) 349-9518; High end, hand blown, glass water pipes
Still operating; 541.563.8632; Furnace/Kiln, Colored glass present in process
Still operating; 503-436-2359; Live colored glass blowing, gallery
Still operating; (541) 899-3997; Glassware, art or decorative; Everyday Glassware Volumetric Glassware Laboratory Glassware Chemistry Glassware Pink Depression Glassware

ss, along with lighting and sculpture.





Goldengate Glassworks LLC	*2757 W 29th Ave*	*Eugene*
Hawthorne Studio Incorported	*96624 Sixes River Rd*	*Sixes*
Wolf Artistic Glass Grey	*730 Birch St*	*Junction City*
Oregon Coast Glasswork	*616 E Olive St*	*Newport*
Design Lite Studio LLC	*6218 N Oberlin St*	*Portland*
Donald Carlson	*1389 Old River Rd Ne*	*Siletz*
Canterbury Stained Glass Co	*150 Patrick Ln*	*Ashland*
Duncan Dichroic LLC	*7200 Se 92nd Ave Ste F*	*Portland*

Lane	*OR*	*97405*	*44.024143*	*-123.133772*	*Pressed and blown glass, nec, nsk*
Curry	*OR*	*97476*	*42.805069*	*-124.323921*	*Glass containers*
Lane	*OR*	*97448*	*44.220391*	*-123.196785*	*Pressed and blown glass, nec, nsk*
Lincoln	*OR*	*97365*	*44.636181*	*-124.045051*	*Pressed and blown glass, nec, nsk*
Multnomah	*OR*	*97203*	*45.583106*	*-122.731155*	*Products of purchased glass*
Lincoln	*OR*	*97380*	*44.73716*	*-123.907365*	*Pressed and blown glass, nec, nsk*
Jackson	*OR*	*97520*	*42.211016*	*-122.737924*	*Products of purchased glass*
Multnomah	*OR*	*97266*	*45.470506*	*-122.568449*	*Pressed and blown glass, nec, nsk*

Still operating; 541-912-2929; www.colortubing.com; color pattern tubing
Still operating; (541) 332-7635; Chrishawthorne.com; Cargo Containers; Commercial Art & Graphic Design *Cremation Containers* *Collapsible Containers* *Custom Containers* *Containers*
Still operating; (541) 998-8404; storm_of_dragons@yahoo.com; Glass-Blowers Manufacturers, mfg pressed blown glass;
Still operating; (541) 574-8226; info@oregoncoastglassworks.com; offer glass blowing classes, free glass blowing demo
503-286-9158; Stained glass, fused glass and mosaic glass studio and classes
541-444-2972; www.carlsonartglass.com; http://www.therealmothergoose.com/collections/collections_carlson.htm;
Still operating; (541) 488-0666; dalyockey@charter.net; Cabinet Windows Domes & Skylights Windows Repairs & Rest
Still operating; 503.807.3886; duncandichro@gmail.com; Duncan Dichroic LLC is a small, fairly new glass product manu

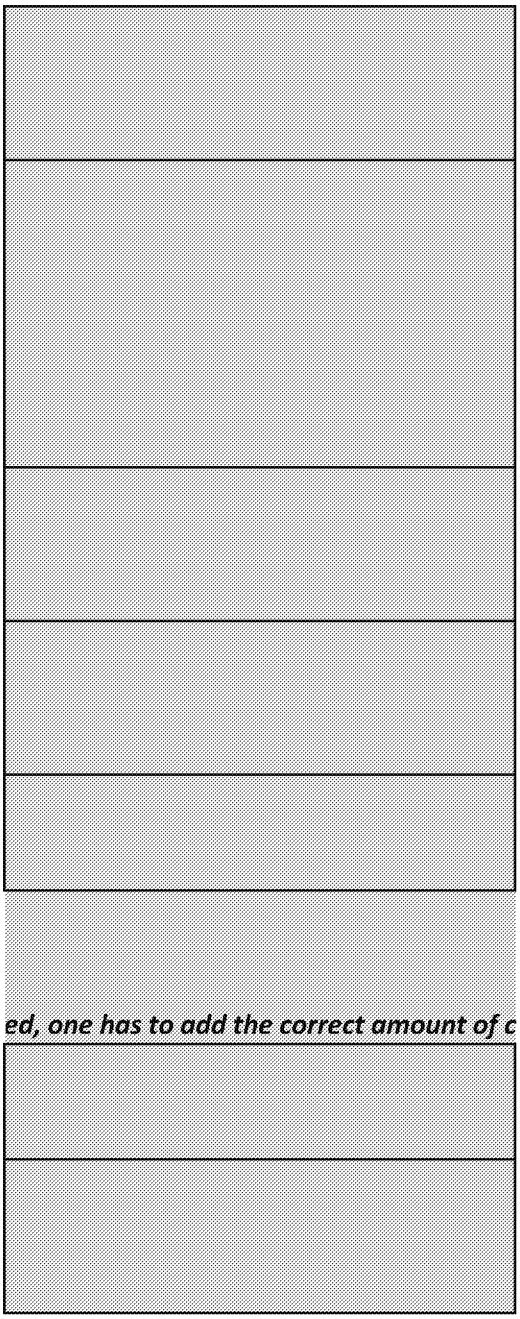
ınstrations, and a gift gallery		

he chose to build himself a small studio at his home and took on the challenge of making glass;

orations New Church Windows (Glass artists)

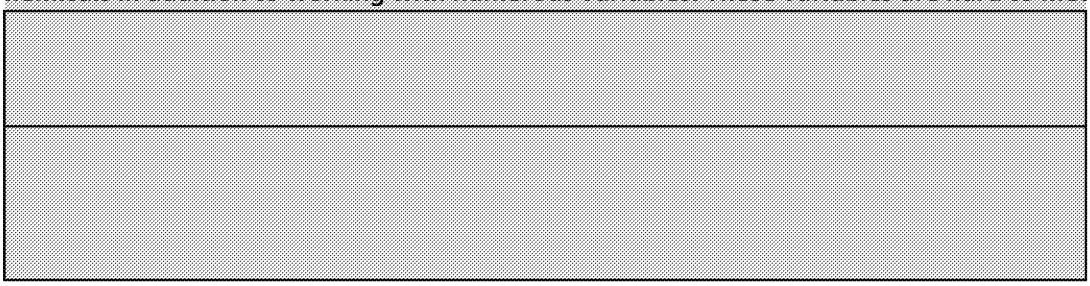
facturer in Portland, Oregon. It opened in 2013

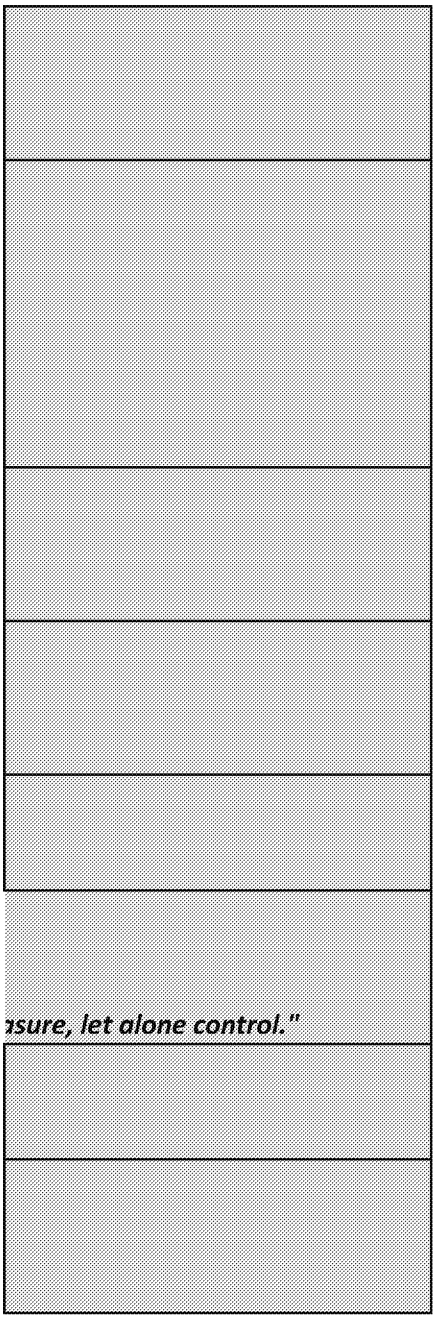
"To secure the desired color, all one has to do is add the appropriate amount of chemicals. But with r



ed, one has to add the correct amount of c

hemicals in addition to working with numerous variables. These variables are hard to mea




nsure, let alone control."

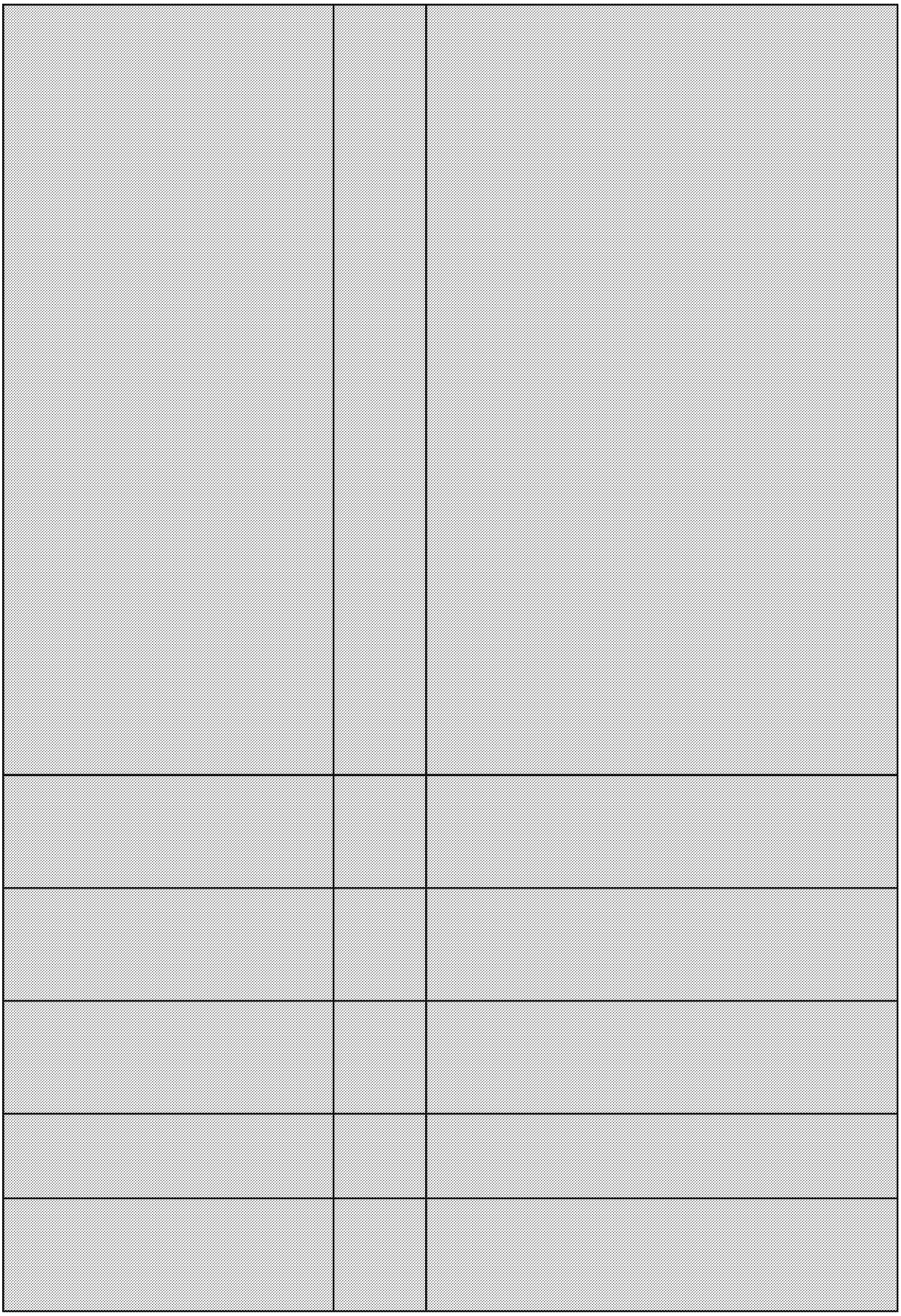
Antique American Stained Glass	*82900 Butler Grade Rd*	*Helix*
Old Town Glass	*3423 Se Division St*	*Portland*
NIELSEN'S CERAMICS	*11350 Ne Klickitat St*	*Portland*
Fusion Headquarters	*15500 Ne Kincaid Rd*	*Newberg*
Heart of Glass	*54274 Dahlgren Rd*	*Scappoose*
Pyrofuse	*1161 23rd St Ne*	*Salem*

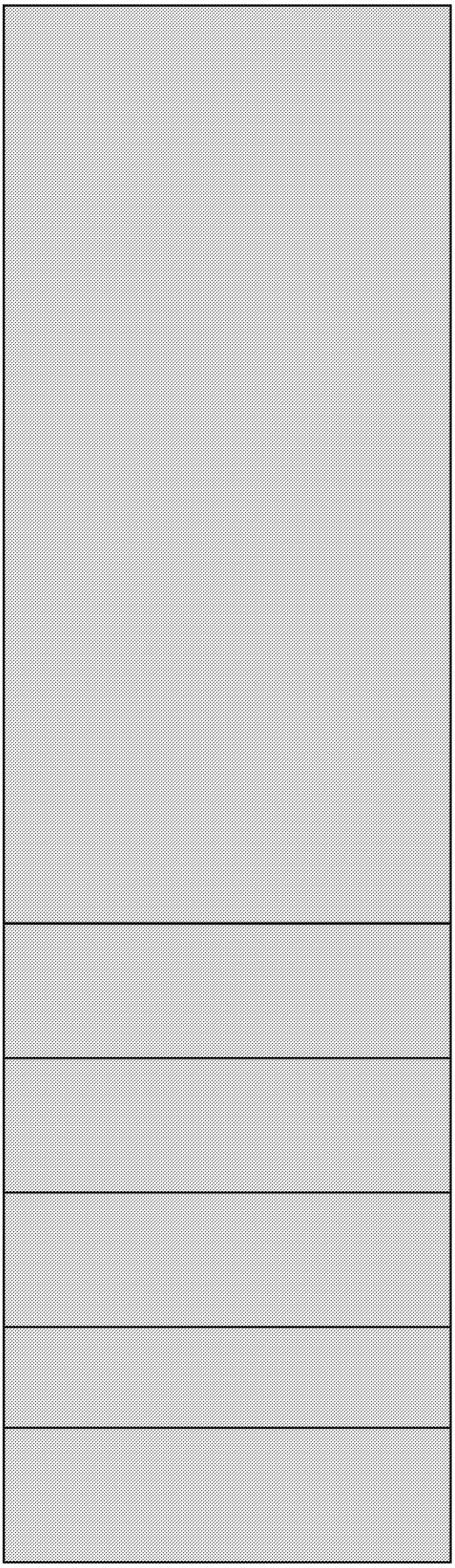
Umatilla	*OR*	*97835*	*45.934854*	*-118.705914*	*Flat glass, nsk*
Multnomah	*OR*	*97202*	*45.504936*	*-122.629253*	*Pressed and blown glass, nec, nsk*
Multnomah	*OR*	*97220*	*45.5465*	*-122.545904*	*Pressed and blown glass, nec, nsk*
Yamhill	*OR*	*97132*	*45.328427*	*-122.937501*	*Pressed and blown glass, nec, nsk*
Columbia	*OR*	*97056*	*45.782765*	*-122.896271*	*Products of purchased glass*
Marion	*OR*	*97301*	*44.944738*	*-123.006265*	*Pressed and blown glass, nec, nsk*

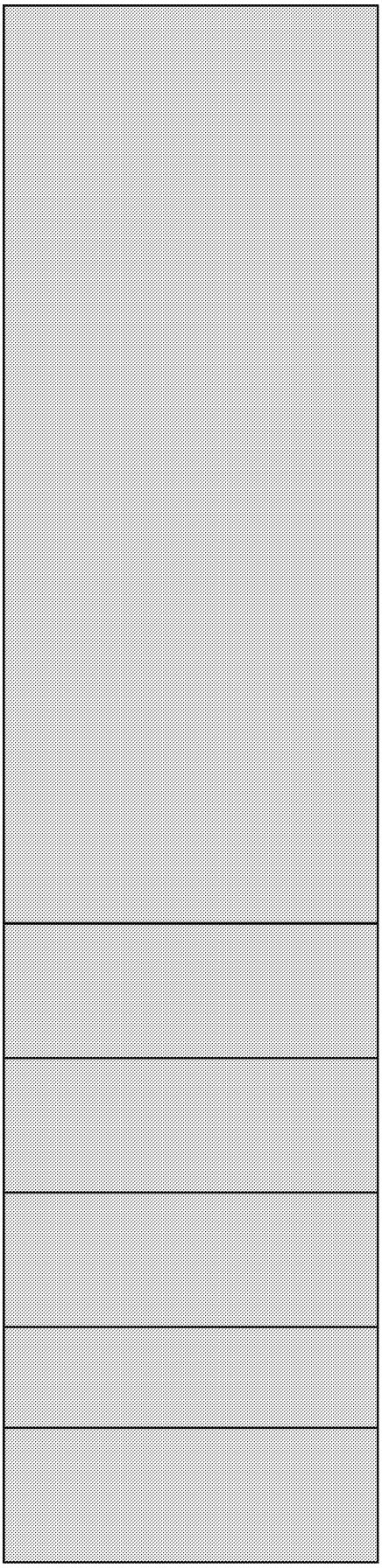
http://www.antiqueamericanstainedglasswindows.com/_Media/20150204_125759-2_med_hr.jpeg; Home *Arched Windows* *Arts and Crafts Windows* *Belcher Mosaic Windows* *Beveled Glass Windows* *Doors and Door Panels* *Entry Sets* *Etched/Wheel Cut Windows* *Figural Windows* *Floral Windows* *Jewels, Tiles and Turtlebacks* *Landing Windows/Sets* *Mark & Jeanne Bogenrief/Bogenrief Studio's* *Painted Windows* *Povey Bro. Windows* *Religious Windows* *Round Windows* *Scenic Windows* *Sidelights* *Stained/Beveled Glass Combination Windows* *Stained and Jeweled Windows* *Stained Glass Ceilings/Domes* *Stained/Beveled and Jeweled Glass Combination Windows* *Tiffany Studio's, John LaFarge?* *Transoms* *W.J. McPherson*
Still operating; 503-223-1875; Glass blower/artist
Still operating; (831) 393-0524; (503) 252-1672 ; munktiki.com ; Nielsen's Ceramics provides B2C services in the form c
Still operating; (503) 538-5281; Glass Fusing Supplies; retailer; glass fusing classes
Still operating; (503) 325-5263; aheartofglass@ymail.com; Stained Glass custom design studio and retail shop. Stained
Still operating; (503) 399-0653; www.pyrofuse.com; a wide variety of art mediums; Artists

)f Christmas Tree Ornaments, From Glass Produced On-Site from its single location in Oregon.

Glass Repairs. Retail shop space includes jewelry and paintings and unique gift items.



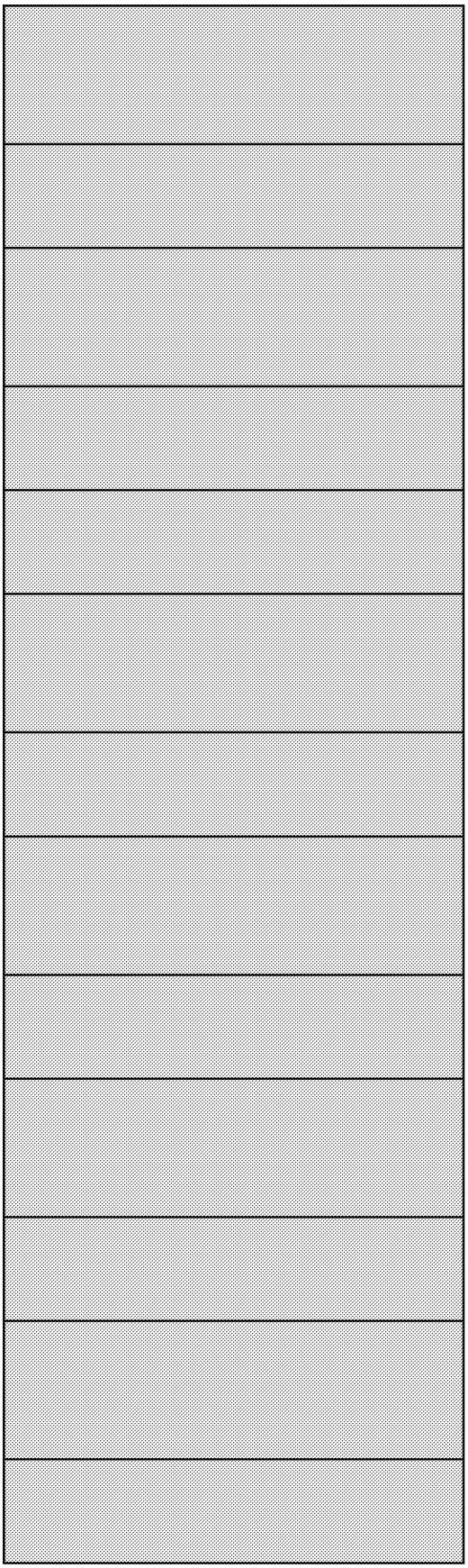


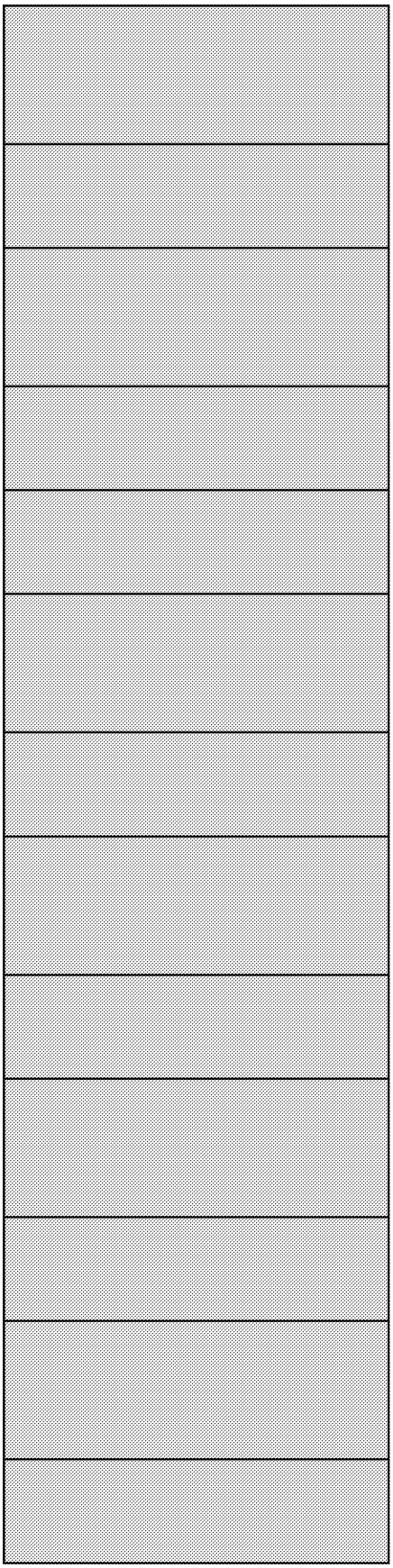


Vines Art Glass	*47074 Highway 101*	*Bandon*
Howling Wolf Art Glass	*3525 Ne 46th Ave*	*Portland*
Nichols Art Glass	*912 W 6th St*	*The Dalles*
Karen Moyer Glass	*26291 Ne Butteville Rd*	*Aurora*
Flame Wrangler	*265 Owosso Dr*	*Eugene*
R J Glasswork	*108 Sw Frenwood Way*	*Beaverton*
Graffius Glass Art	*1274 Country Club Rd*	*Hood River*
The Gorge Glashaus	*2126 Sw Halsey St*	*Troutdale*
The Attic Workshop	*93256 Arago Valley Ln*	*Myrtle Point*
Alder House Glass	*611 S Immonen Rd*	*Lincoln City*
Valley View Glass LLC	*17257 Nw Ivybridge St*	*Portland*
Shattered Illusions	*10420 Sw View Ter*	*Portland*
Destiny Stained Glass	*14122 Se Center St*	*Portland*

Coos	*OR*	*97411*	*43.014326*	*-124.415242*	*Pressed and blown glass, nec, nsk*
Multnomah	*OR*	*97213*	*45.548517*	*-122.616324*	*Products of purchased glass*
Wasco	*OR*	*97058*	*45.603992*	*-121.196571*	*Pressed and blown glass, nec, nsk*
Marion	*OR*	*97002*	*45.288745*	*-122.772738*	*Products of purchased glass*
Lane	*OR*	*97404*	*44.092246*	*-123.121022*	*Products of purchased glass*
Washington	*OR*	*97005*	*45.519091*	*-122.808933*	*Pressed and blown glass, nec, nsk*
Hood River	*OR*	*97031*	*45.684945*	*-121.570469*	*Products of purchased glass*
Multnomah	*OR*	*97060*	*45.538547*	*-122.406348*	*Pressed and blown glass, nec, nsk*
Coos	*OR*	*97458*	*43.113385*	*-124.201118*	*Products of purchased glass*
Lincoln	*OR*	*97367*	*44.887021*	*-124.007879*	*Pressed and blown glass, nec, nsk*
Washington	*OR*	*97229*	*45.560647*	*-122.855488*	*Products of purchased glass*
Washington	*OR*	*97224*	*45.41583*	*-122.783938*	*Pressed and blown glass, nec, nsk*
Multnomah	*OR*	*97236*	*45.493137*	*-122.517784*	*Products of purchased glass*

Still operating; (541) 347-2652; Blown glass artist
Still operating; 503) 288-8976; www.howlingwolfglass.com; handblown glass vases
Still operating; (541) 296-2143; Nichols Art Glass (Facebook); Blown glass artist
(503) 678-7895; karenmoyerglass.com; Fast Glass Shattering Glass Cut Glass Hoosier Glass Vintage Glass
Still operating; (541) 689-0072; Inquires@flamewrangler.com; Blown glass artist and instructor (U of Oregon)
Ronald Roden (Principle); (503) 643-2789;
Still operating; (541) 387-4436; Contact: Craig Brian Graffius; Art glass
Still operating; (503) 669-8610; Glass-blowing artisans, Retail shop on site at McMennamins Edgefield location
Still operating; (541) 396-3252; Bearden's Stained Glass Victorian Stained Glass Tulip Stained Glass Leaded Stained Glass Lighthouse Stained Glass
Operates 5.01-10.31; (541) 996-2483; http://alderhouse.com/; Blown glass artist(s), gift shop retailer
Still operating; (503) 439-6968; Art Glass; Karg Art Glass Frantz Art Glass Wholesale Stained Glas Decorative Art Glass Rudy Art Glass
Still operating; (503) 639-6344; Pasta Bowls Glass Bowls Plastic Bowl Glass Bowl Cereal Bowl
Still operating; (503) 761-5429; Fast Glass Shattering Glass Cut Glass Hoosier Glass Vintage Glass





William Podd McClure	*19427 Nw Morgan Rd*	*Portland*
Zweifel Art Glass Inc	*20375 Williams Hwy*	*Williams*
Local Area Artists, LLC	*8049 Se Ogden St*	*Portland*
American Made Crafts	*9200 E Evans Creek Rd*	*Rogue River*
Sue Purr Designs	*84729 Mcbeth Rd*	*Eugene*
Bent Glass	*235 Nw Green Acres Ln*	*Albany*
The Cauldron	*64236 Crosswinds Rd*	*Bend*
Eugene Glass School	*575 Wilson St*	*Eugene*
Lomont Glassworks	*34428 Deerwood Dr*	*Eugene*
Duncan Dichroic	*6819 Se Tolman St*	*Portland*
ALICE DUNLOTH	*18065 Sw Blanton St*	*Beaverton*
Heads Up Apparel and Glass Art	*776 Sw 6th St*	*Grants Pass*
Windsongs Stained Glass	*53708 Mckay Dr*	*Scappoose*

Multnomah	*OR*	*97231*	*45.66647*	*-122.877919*	*Pressed and blown glass, nec, nsk*
Josephine	*OR*	*97544*	*42.221325*	*-123.271746*	*Products of purchased glass*
Multnomah	*OR*	*97206*	*45.471124*	*-122.580178*	*Products of purchased glass*
Jackson	*OR*	*97537*	*42.542116*	*-123.144318*	*Pressed and blown glass, nec, nsk*
Lane	*OR*	*97405*	*43.961144*	*-123.135284*	*Pressed and blown glass, nec, nsk*
Linn	*OR*	*97321*	*44.650306*	*-123.106122*	*Pressed and blown glass, nec, nsk*
Deschutes	*OR*	*97703*	*44.130979*	*-121.306574*	*Pressed and blown glass, nec, nsk*
Lane	*OR*	*97402*	*44.053546*	*-123.131553*	*Pressed and blown glass, nec, nsk*
Lane	*OR*	*97405*	*43.97735*	*-122.993813*	*Products of purchased glass*
Multnomah	*OR*	*97206*	*45.477497*	*-122.592908*	*Products of purchased glass*
Washington	*OR*	*97078*	*45.491754*	*-122.863175*	*Pressed and blown glass, nec, nsk*
Josephine	*OR*	*97526*	*42.434108*	*-123.330164*	*Products of purchased glass*
Columbia	*OR*	*97056*	*45.774992*	*-122.876961*	*Products of purchased glass*

Still operating; (971)- 570-5655; William Mcclure, Owner; 8315 N Hendricks St. (Secondary business address); Order G

Still operating; (541) 846-0727; www.zweifelartglass.com; Craig H Zweifel (President); Colored glass vases; Fast Glass Shattering Glass Cut Glass Hoosier Glass Vintage Glass

Still operating; (503) 771-9998; http://mkdstainedglass.com/;
Still operating; Unique Garden Art-Candle Holders Made By Hand, From Reclaimed Glass.

Still operating; (541) 582-2241; lynnw@magick.net; http://americanmadecrafts.com/; Handblown and decorated col

(541) 683-4047; http://www.suepurrdesigns.com; Glass art fused glass artist gallery tiles dinnerware sculpure decor fine art plates glassware plate

Still operating; (541) 967-0135; Lillian Blyth (Owner); Pressed or blown glass

Still operating; (541) 382-4309; James P Lovely (Owner); Glass-Blowers Manufacturers

Still operating; (541) 342-2959; azitamm@icloud.com; Classes for Beginner to Advanced…Artists and Hobbyists…for Business and for Pleasure… Flameworking (Lampworking) – Beadmaking – Kiln Arts – Fusing – Kiln Casting – Coldworking – Glass Gallery

Still operating; (541) 741-8229; www.lomontglassworks.com; patti@lomontglassworks.com; Fused, etched, kiln-cast, and stained glass; Fast Glass Shattering Glass Cut Glass Hoosier Glass Vintage Glass

Still operating; 503.807.3886; duncandichro@gmail.com; Duncan Dichroic is located in Portland, Oregon. This organiza

Still operating; (503) 591-9112; Clowning Around Molds (Alternate Name); Founded in 1980, Alice Dunloth is a small gla

Still operating; (541) 956-1245; "Head Shop" (glass devices to facillitate marijuana smoking, water-pipes, storage jars)

(503) 543-6824; Patricia Landers (Owner); Bearden's Stained Glass Victorian Stained Glass Tulip Stained Glass Leaded Stained Glass Lighthouse Stained Glass

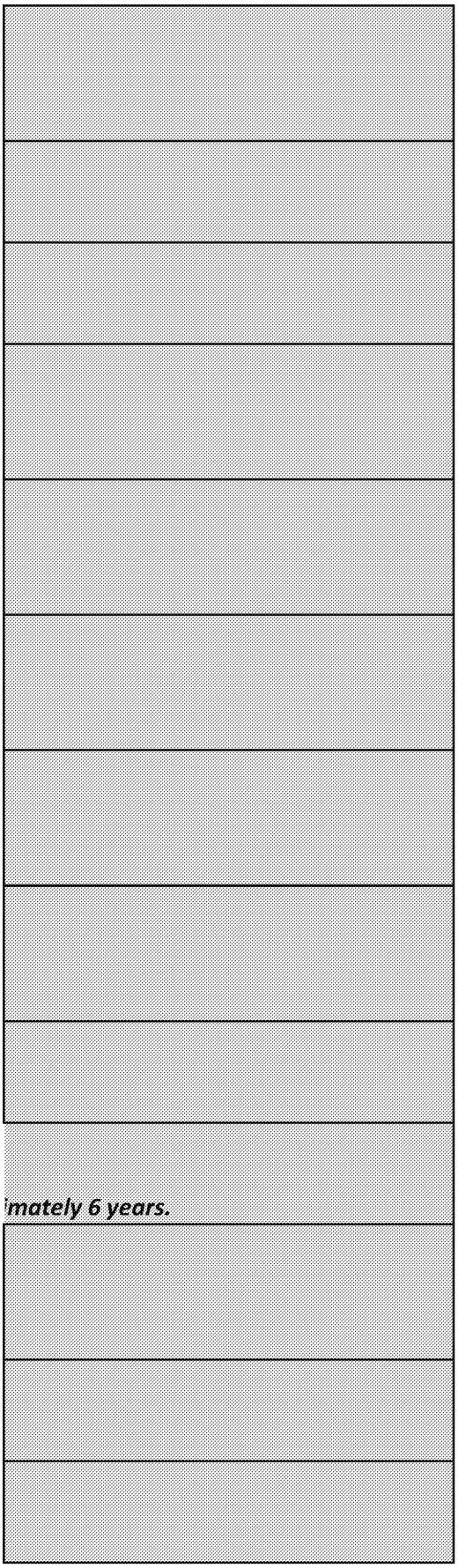
lassware Anchor Hocking Glassware Simon Pearce Glassware Blue Glassware Riedel Glassware

lectible bells and thimbles for collectors (Painted clear blown glass)

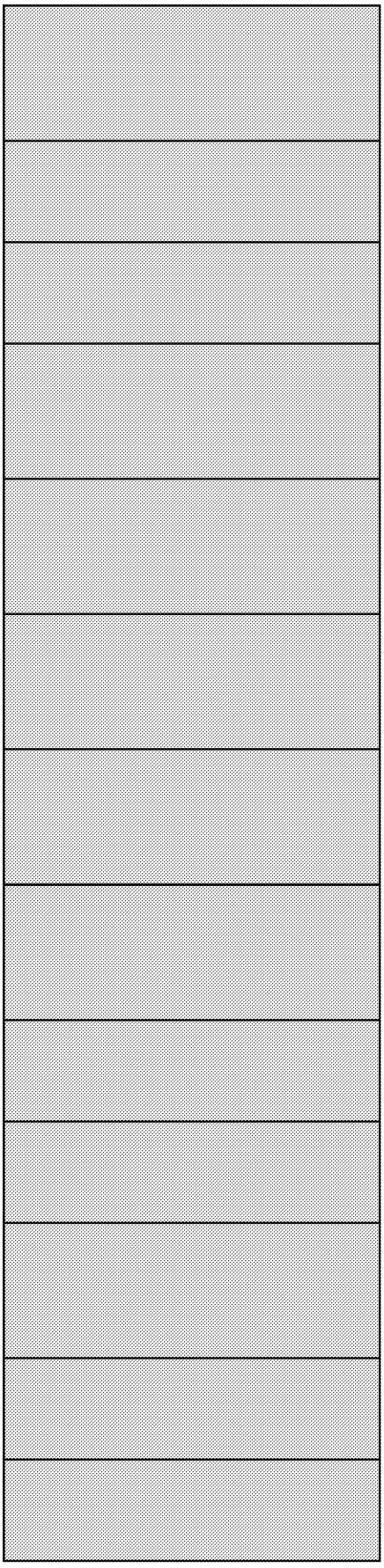
tion primarily operates in the Art Glass: Made From Purchased Glass business / industry within t

ıss product manufacturer in Beaverton, Oregon. It has 1 full time employee

he Stone, Clay, Glass, and Concrete Products sector. This organization has been operating for approxi



imately 6 years.



C W Glass Art	*4057 N Hess Rd*	*Mount Hood Parkdale*
Liquid Glass Fusion	*207 Berrydale Ave*	*Medford*
Majics Glowglass	*3648 Mahlon Ave*	*Eugene*
The Raindrop Factory	*1287 Bay St*	*Florence*
Roseburg Glass School	*714 Doerner Rd*	*Roseburg*
Parabelle Glass	*1313 Se Spokane St*	*Portland*
Trautman (Trautman Art Glass/ TAG)	*9755 SW Commerce Circle, B-4*	*Wilsonville*
Rich Glass	*4035 N Missouri Ave*	*Portland*
Uroboros Glass	*2139 N Kirby Ave*	*Portland*
Bandon Glass Art Studio	*488451*	*240 Hwy. 101*
Wolf Artistic Glass Grey	*730 Birch St*	*Junction City*
Fabricated Glass Specialties	*490451*	*101 E. Rapp Rd.*
Gathering Glass Studio, LLC	*1677223*	*322 N. Pioneer St.*
Gazelle Glass, Inc.	*1795266*	*1136 Main St.*
Glass Alchemy Ltd.	*486025*	*6539 N.E. 59th Pl.*
Glass Forge Gallery & Studio	*488309*	*501 S.W. G St.*
Insane Glass	*1805288*	*80 S.E. Madison St.*
Northstar Glassworks, Inc.	*490564*	*9386 S.W. Tigard St.*
LRAPA Sources		
Aurora Glass		*2345 W. Broadway @ McKinley*
Cornerstone Glass Studio & Supplies		*1068 W 2nd Ave*
Cornerstone Campus Store		*443 E. 13th Street*
Cornerstone Teaching Facility		*1002 W. 2nd Street Unit #8*
Eugene Glass School		*784 S. Bertelsen Rd, Unit A*
Old World Stained Glass		*(See Website for contact info)*
John rose Stained Glass		*1168 West 2nd Avenue*

Hood River	OR	97041	45.536635	-121.55694	Products of purchased glass
	OR	97501	42.350968	-122.893353	Products of purchased glass
Lane	OR	97401	44.06522	-123.052722	Pressed and blown glass, nec, nsk
	OR	97439	43.96638	-124.107111	Products of purchased glass
Douglas	OR	97471	43.244819	-123.489763	Pressed and blown glass, nec, nsk
Multnomah	OR	97202			
Clackamas	OR	97070			
Multnomah	OR	97227			

Multnomah	OR	97227			

Bandon	97411	Coos	PO Box 1516	Bandon	97411-1516
Lane	OR	97448	44.220391	-123.196785	Pressed and blown glass, nec, nsk
Talent	97540	Jackson	101 E Rapp Rd	Talent	97540-8628
Ashland	97520	Jackson	322 N Pioneer St	Ashland	97520-1812
Philomath	97370	Benton	PO Box 854	Philomath	97370-0854
Portland	97218	Multnomah	6539 NE 59th Pl	Portland	97218-2707
Grants Pass	97526	Josephine	501 SW G ST	Grants Pass	97526-2472
Portland	97214	Multnomah	80 SE Madison St	Portland	97214-3314
Tigard	97223	Washington	PO Box 230488	Tigard	97281-0488

Eugene	97402	Lane			
Eugene	97402	Lane			
Eugene	97402	Lane			
Eugene	97402	Lane			
Eugene	97402	Lane			
Eugene	97402	Lane			
Eugene	97402	Lane			

(541) 352-6865; CHRISTOPHER C WARD (Owner, President); Karg Art Glass Frantz Art Glass Wholesale Stained Glass Decorative Art Glass Rudy Art Glass
Adam Spiegel, Owner; (541) 282-8585; Fast Glass Shattering Glass Cut Glass Hoosier Glass Vintage Glass
Brian R Nelson, Owner; (541)- 606-5738; Mfg Pressed/blown Glass
Donald Ray Douglas (Contact); (541) 997-2773; 1 (800) 997-2773; http://www123.pair.com/raindrop/oldtownflorence/raindropfactory/home.htm; florencerentals.com; sales@raindropfactory.com; Small blown glass sculptures
(541) 643-1963; Daniel Shelton (Principal); Glass-Blowers Manufacturers

Julie Scrutton Lewis; Minerals@FrankDanielsMinerals.com; 970-242-5255; Paperweights

(503) 482-5475; http://www.taglass.com/; http://www.taglass.com/AboutUs.asp; sales@taglass.com

503-280-7946

uroboros.com; 503-284-4900

541-347-4723
3572

541-535-1581
541-488-4738
541-929-6464
503-460-0545
541-955-0815
503-236-8628
503-684-6986

1.888.291.9311
541-341-1788
541-844-1585
541-341-1788
(541) 342-2959
541-547-0821
541-342-6872

541-347-9241		*www.dutchschulze.com*
0.16	*4*	*4*
541-535-2910	*800-347-5952*	*www.fabglass.com*
541-488-4739		*www.gatheringglass.com*
541-929-4364		*www.gazelleglass.com*
503-460-0546		*www.glassalchemyarts.com*
541-955-0816		*www.glassforge.com*
503-670-0978		*www.northstarglass.com*
		www.auroraglass.org
		http://cornerstoneglass.com/
		http://cornerstoneglass.com/
		http://cornerstoneglass.com/
		http://www.oldworldstainedglass.com/contact.html
		http://www.johnrose-glass.com/

dutcharo@dutchschulze.com	*4*	
32290000	*32290000*	*327212*
fabglass@fabglass.com	*5*	*Flat Glass*
info@gatheringglass.com	*4*	
mail@gazelleglass.com	*4*	*Other Pressed and Blown Glass and Glassware*
info@glassalchemyarts.com	*16*	*Glass Products Made of Purchased Glass*
glasforge@aol.com	*4*	*Other Pressed and Blown Glass and Glassware*
insaneglass@yahoo.com	*4*	
charlesb@northstarglass.com	*20*	*Flat Glass*

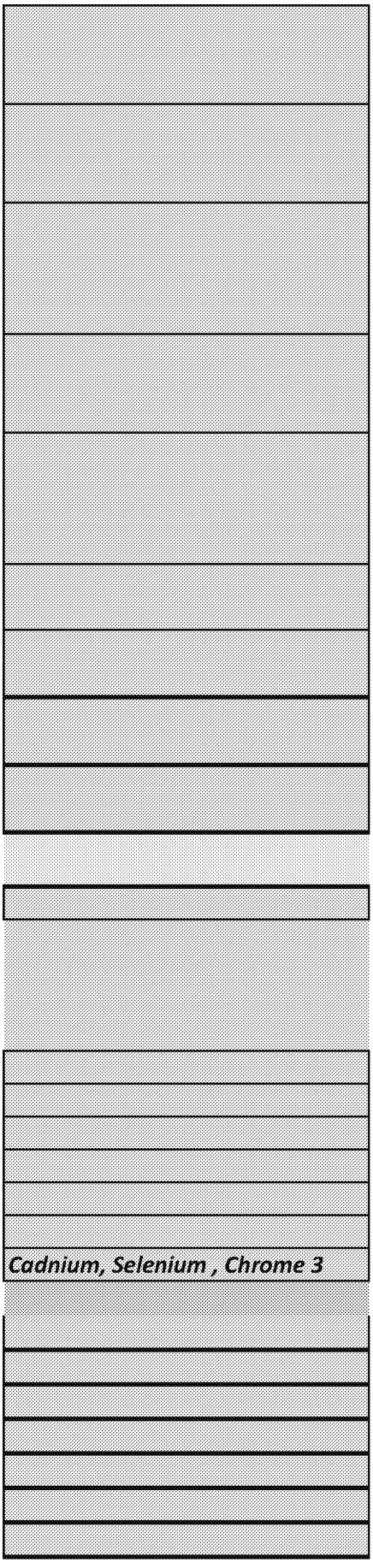
azitamm@icloud.com		
mailto:john.rose3@comcast.net		

Glass_pressed and blown
327212
Glass products from purchased glass
Glass_pressed and blown
Glass products from purchased glass
Glass_pressed and blown
Glass_pressed and blown
Glass_pressed and blown
Glass products from purchased glass

Art glassware

Still operating; (541) 998-8404; storm_of_dragons@yahoo.com; *Glass-Blowers Manufacturers, mfg pressed blown glass;*

Glass fabrication & mirrors
Functional & decorative blown glass products
Hand-blown art glass
Ground borosilicate glass pigments & colored art glass in rods & frits
Hand-blown art glass
Handblown & art glass
Colored borosilicate glass rod, frit & powder


Cadnium, Selenium , Chrome 3

Glass Fuser		*1849 Willamette St.*
Art of Glass		*965 Tyinn #20*
Sumner Stained Glass		*303 S 5th St #127*
Jaguar Art Glass		*890 Willow Avenue*
Maher Glass Studio		*933 Pearl St.*
Chris Paulson		*1160 W 2nd Ave*

Eugene	*97402*	*Lane*			
Eugene	*97402*	*Lane*			
Springfield	*97477*	*Lane*			
Eugene	*97402*	*Lane*			
Eugene	*97402*	*Lane*			
Eugene	*97402*	*Lane*		*44.057503*	*-123.111139*

541-343-3688
541-485-8650
360-378-2761; 541-484-2768
541-484-9629
541-344-8445
Pressed and blown glass, nec, nsk

		http://www.theartofglassonline.com/
		http://sumnerstainedglass.com/
		www.JaguarArtGlass.com
Still operating; (541) 344-7393; Fused glass artist; Kiln work up to 1450 degrees F.		

info@glassfuser.com		
theartofglass@comcast.net		
info@SumnerStainedGlass.com		
info@jaguarartglass.com